

9.4 ENVIRONMENTAL IMPACT ISSUES

9.4.1 National Environmental Policy Act

A mandate to incorporate NEPA values into RFETS decision documents is codified in the Rocky Flats Cleanup Agreement (RFCA) (RFCA, ¶ 95). In addition, this Decommissioning Operations Plan (DPP) is defined as a decision document under RFCA (RFCA, ¶ 93 and 119). In recognition of this requirement, this section provides a description of potential environmental impacts which may be associated with the decommissioning buildings, facilities, and equipment at RFETS.

Most of the information in this section is taken from previous Site NEPA documents, including the (unpublished) Rocky Flats Draft Site-Wide Environmental Impact Statement (SWEIS) (Preliminary Draft, dated July 15, 1996). Alternatives analyzed in that document involves a wide spectrum of site cleanup activities. One alternative examines decommissioning of all buildings and structures at the Site; another analyzes the complete decontamination, decommissioning, and demolition (DD&D) of a generic 100,000 square foot plutonium-contaminated facility. In comparison to the generic facility, Building 779 is an approximately 64,000 square foot structure, 36,409 square feet of which contained process equipment. Glovebox areas in the generic facility were patterned after configurations in Building 779 because this building contains numerous processing areas and was the subject of detailed time and cost estimates to complete DD&D. The discussion below describes the data collected and impacts analyzed for these two alternatives as they apply to decommissioning of Building 779 to the extent practical and appropriate.

9.4.2 Environmental Impact Issues

As described in earlier chapters and in Appendix 1, the Building 779 Complex is located entirely within the (secured) Protected Area of the Site's Industrial Area (see Figure 1.1). Building 779 housed less than 1000 kg (1 ton) of plutonium residues that required treatment (DOE/EA-1120, p. 3-6), and these have since been removed. Initial investigations show that many interior surfaces, process drains, piping, gloveboxes, filters, sumps, and other equipment are radioactively contaminated to various levels (see Section 4.0). Decontamination and decommissioning of Rooms 152 and 154 in Building 779 was one of six pilot projects initiated in 1994 and intended to provide "lessons learned" that could be applied to subsequent projects (Categorical Exclusion RFO/CX23-94). In addition to Building 779, the Complex consists of two cooling towers and two cooling tower chillers, a cooling tower pump house, a paint and storage facility, a metal storage facility, and a gas bottle storage facility (see Appendix 1).

The proposed decommissioning activities for the Building 779 Complex involve asbestos abatement, decontamination of interior surfaces and equipment by vacuuming and wiping, disconnection of electrical power, draining of piping systems and equipment, removal of gloveboxes and other equipment, further decontamination by wiping, washing, scabbling, and other methods (see Appendix 2), and dismantling and demolition of the buildings. Many of these activities could qualify as categorical exclusions under DOE's NEPA regulations (e.g., removal of asbestos from buildings (B1.16); demolition/disposal of buildings (B1.23);

disconnection of utilities (B1.27); and minor activities to place a facility in an environmentally safe condition, no proposed uses (including reducing surface contamination, but not including conditioning, treatment, or processing of spent nuclear fuel, high-level waste, or special nuclear materials) (B1.28)).

Given the existing built environment and industrial setting, environmental impact issues associated with the proposed decommissioning and decontamination activities for the Building 779 Complex are limited in scope. The proposed activities are unlikely to result in discernable adverse effects to biological resources, including vegetation, wetlands, wildlife habitat, and state and federal sensitive (e.g., threatened and endangered) species populations or habitat. The building to be decommissioned is not located in a floodplain and the proposed activities will not be affected by, or themselves affect, any floodplain. No wild and scenic rivers, prime agricultural soils, parks or conservation areas, or natural resources will be affected. The proposed activities will provide employment for a very small number of people, most of whom are expected to come from the current Site workforce; thus, the activities are also unlikely to result in adverse socioeconomic effects. Demolition of the Complex is not expected to be noticeable offsite and thus is not expected to result in major changes in visual quality of the Rocky Flats area.

Therefore, this discussion of environmental impact issues focuses more intensely on the following areas of potential impacts:

- Mobilization of radioactive and other contaminants into the environment via soils, air, surface waters, or groundwater;
- Health and safety of workers who may be exposed to radioactive and toxic or hazardous materials (including lead, asbestos, and PCBs), and health and safety of the public, both during normal decommissioning activities as well as accidents;
- Environmental issues associated with waste management, including the contribution of wastes generated by the proposed activities to the decreasing site-wide capacity for interim storage and transportation of waste;
- The physical removal of Building 779 as an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at Rocky Flats; and
- This project's contribution to site-wide cumulative impacts.

Geology and Soils

Decommissioning the Building 779 Complex will disturb minor land acreage, most of which has been previously disturbed. Activities such as excavation could cause localized landslides or slumping to occur. Some recontouring of the soils will occur after buildings are removed. There will be short-term increases in soil erosion and siltation and small, temporary losses of

soil productivity. Contamination of soils from decommissioning activities is not expected because building structures will be decontaminated prior to demolition of the structures themselves.

Air Quality

Potential impacts to air quality resulting from the decommissioning of the Building 779 Complex include asbestos emissions resulting from asbestos removal, Beryllium (Be) emissions resulting from the decontamination and removal of equipment and building materials, radionuclide emissions resulting from the decontamination and removal of equipment, and fugitive dust emissions resulting from transportation activities associated with the decommissioning and demolition activities (if the final decision is to demolish). Air emissions from these activities will be controlled and monitored in accordance with the Site health and safety program (Section 7.0).

Asbestos is present in several areas of Building 779, primarily in the form of pipe insulation. These materials will be removed by a properly certified contractor in accordance with applicable state and federal regulations. Assuming that the removal, transportation, and final disposition is in accordance with applicable regulations, there is minimal risk of an asbestos release to the air.

Some equipment within Building 779 is potentially contaminated with Be. The cleanup action level for Be contamination is 25 μg per square foot. Cleanup and removal of materials and equipment contaminated with Be has a very small potential to cause a release to the air. Management of the contaminated materials and equipment in accordance with current site procedures will result in minimal risk to both on- and off-site personnel. Cleanup of any building materials to the 25 μg per square foot level will minimize any potential Be release during the demolition of Building 779.

Decontamination, size reduction, removal, and ultimate disposal of equipment and materials in Building 779 have the potential to release radionuclides to the air. Decontamination and size reduction activities take place within containment (either glove box, B box, or hood) that is equipped with a HEPA filter. This essentially eliminates the potential for a radionuclide release short of an accident during the transportation of the contaminated material. Stack monitoring is also conducted to ensure the integrity of the HEPA filtration equipment.

Fugitive dust emissions will result from the transportation of materials and wastes from the Building 779 complex. Should the final decision be made to totally demolish the complex, there will be significant, short term fugitive dust emissions during the demolition of the structure itself. Building 779 is a reinforced concrete and cinder block construction which will require the use of heavy equipment to reduce. Because of the remoteness of the Complex to site boundaries, impacts will be short term to personnel working in areas proximate to the Building 779 complex.

Miscellaneous hazardous materials will be removed from several structures within the Building 779 complex. These materials will be managed in accordance with existing Site procedures and there will be little risk for air emissions.

Water Quality

Depending on the final surface treatment and contouring, removal of the Building 779 Complex structures is unlikely to change surface drainage substantially. Assuming the building is to be demolished and the foundation is to be removed, there will be increased infiltration of water during a storm event. This may be a positive impact in that it represents a return to the natural conditions that existed prior to the construction of the Site, with net decrease in stormwater runoff from the Site and a corresponding increase in the amount of precipitation that percolates into the soil.

Potential impacts to water quality resulting from the decommissioning of the Building 779 Complex include the release of liquid wastes contained in the facility storage tank, impacts to storm water runoff during building demolition (if the final decision is to demolish), and impacts to groundwater if the facility is demolished and this includes removal of the foundation.

Existing wastes collected in the facility storage tank located in the basement of Building 779 present only a negligible risk if they are managed in accordance with existing site procedures.

Building demolition is likely to cause the disturbance of a significant area and can result in increased sediment loads to the storm water collection system unless preventative measures are taken. Depending on the total area affected and current State of Colorado regulations, this action may require a specific stormwater permit modification.

Among the techniques under consideration for decontamination of the Building 779 Complex is the use of water or steam to remove contamination and loose debris (Appendix 2). While this technique is effective in removing contamination, it also generates large volumes of potentially contaminated water and may even contribute to the spread of contamination. Surface water samples from the Building 779 Cluster drainage sub-basin will be collected using an automated station located to pull samples from the entire sub-basin's runoff. Water used for decontamination will be treated prior to release.

The extent of contamination of groundwater underlying the Site, including the plume extending east of the industrial area, has been the subject of extensive monitoring and investigation and is well-characterized in existing documentation. Groundwater, which may be contaminated, may be encountered below the basement of Building 779 or as drains and sump pumps are removed. Contaminated water will be treated, as required, prior to release. Building decontamination prior to demolition is expected to eliminate the potential for additional ground water contamination from decommissioning activities.

Human Health Impacts

Radiological Impacts

Decommissioning has the potential to expose involved workers, non-involved workers, and the public to radiological and other contamination because the nature of the work is to remove or fix-in-place contamination. Disruption of contaminants or hazardous materials increases the chance of the contaminant or materials being dislodged, becoming airborne,

and being inhaled by or deposited on humans. For involved workers, deactivation and decontamination activities at Building 779 are estimated to result in a total dose of 13 and 4 person-rem, respectively, or a total of 17 person-rem to workers involved in decommissioning the Building. This exposure would be expected to result in less than 1 (0.006) latent cancer fatalities, assuming the same worker group conducted both deactivation and decontamination activities.

Doses to co-located workers from decommissioning operations at Building 779 alone have not been evaluated. However, the annual radiological exposure of a maximally exposed co-located (unprotected) worker as a result of site-wide decommissioning and other related activities is estimated at 5.3 millirem (a millirem is 1/1000 of a rem). The corresponding risk of a latent cancer fatality to this worker is two in 1,000,000. Similarly, the annual dose to the public as a result of all activities in the RFETS closure project at the peak time of exposure (1997 - 2006) is expected to be 23 person-rem, or a total of 23 rem for all of the 2.7 million people projected to be living within 50 miles of the Site in 2006. This annual dose of 23 person-rem would be expected to result in less than one (0.01) latent cancer fatality in the entire Denver area population. Estimated annual dose to the maximally exposed off-site individual is well below the applicable standard of 10 millirem/year. Estimated doses from Building 779 Complex decommissioning are expected to be a small fraction of those estimates for site-wide activities, as described above.

For comparison purposes, DOE's annual limit for occupational exposure as a result of all activities and through all exposure pathways is 5,000 millirem (5 rem) per person. The Site standard for annual exposure is 750 millirem per person. Natural background radiation in the Denver area results in an annual exposure to approximately 350 millirem per person.

Exposures to workers and the public will be controlled and monitored in accordance with the RFETS radiation safety program (Section 7.4).

Non-radiological Impacts

Non-radiological health effects (from exposure to chemicals) is measured by a hazard index. A hazard index greater than one is considered to be a basis for concern, and the greater the index is above one, the greater the level of concern.

For the full suite of site closure activities (including decommissioning of all buildings), data collected for the SWEIS show a hazard index of 1.4 for a member of the public who is chronically exposed every day for 70 years to all chemicals of concern simultaneously (a highly unlikely event). A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical.

Excessive exposure to chemicals can result in both short-term effects (e.g., difficulty breathing or other temporary conditions) and long-term effects (such as cancer). Data collected for the SWEIS indicates that a member of the public exposed to all chemicals of concern simultaneously every day for 70 years would have a risk of developing cancer of 2 in 10,000,000.

Estimated non-radiological impacts from the Building 779 decommissioning are expected to

be a small fraction of those estimates for site-wide activities, as described above. Exposures to workers and the public will be controlled and monitored in accordance with the RFETS toxic/hazardous materials and chemical safety program (Section 7.3).

Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the Site are exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold. Using a general industry rate for construction to estimate injury and illness cases, site closure activities, including decommissioning of a generic 100,000 square foot production building, are estimated to result in 387 cases of injury and illness during the peak activity period (1997 - 2006). The portion of these cases which would be estimated to result from the Building 779 decommissioning alone would be less than the total site figure.

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the Site; occupational hazards will be controlled, mitigated, and monitored in accordance with the RFETS occupational health and industrial safety programs (Section 7.2).

Plants and Animals

Because the 779 Complex is located in the previously disturbed Industrial Area, impacts to plants and animals are expected to be minimal. Possible minor impacts to other vegetative areas may result as fugitive dust may distribute undesirable materials among existing plant species. Additional impacts may occur to vegetation associated with increased traffic in order to accommodate the decommissioning equipment. Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance. Former building sites will be revegetated with native grasses until future uses of the Site are decided.

Mammals such as rats, mice, and raccoons are known to be residents of or visitors to the Industrial Area. These mammals would be displaced, and some mortality would occur as a result of decommissioning activities. Bird nests attached to buildings planned for demolition would be destroyed, although no direct bird mortality is anticipated.

Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation.

In general, waste generated from decommissioning of Building 779 Complex includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes and facility structural materials. Decommissioning of the Building 779 Complex will generate an estimated 192 cubic feet of transuranic waste (suspect items are duct and glovebox work), and 45,666 cubic feet of low-level waste, plus unestimated but anticipated minimal amounts of mixed waste and hazardous waste. The remaining industrial waste, which has also not been quantified, is expected to be suitable for landfill disposal. Approximately 95 percent of the contaminated waste is expected to be low-level waste (see

Section 8.0).

Decontamination will be performed in conjunction with decommissioning to remove radiological contamination and hazardous constituents. Where feasible, items will be decontaminated to free release conditions. Items that have been decontaminated to a free release condition will be transferred for use at a different location within RFETS, for use at a different DOE facility, or sent to the Property Utilization and Disposal (PUD) organization for appropriate handling. Mixed waste generated from decommissioning activities will be stored in permitted areas on-site, or where feasible, shipped to an approved off-site disposal site. On-site storage of mixed waste will be in accordance with Hazardous Waste Requirements Manual until the material can be shipped for final disposal. Hazardous materials and excess chemicals will be managed as waste, where applicable, and disposed of in accordance with established procedures. Materials and waste will be characterized, stored and disposed of in accordance with the requirements of the Site Waste Management Program which meets state and Federal regulations (Section 8.9).

Waste minimization will be utilized in the planning and management of the Building 779 Complex decommissioning wastes. Elimination and reduction of waste generated as a result of decommissioning is a high priority. Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented (Section 8.0).

With respect to transportation concerns, the Building 779 Complex decommissioning project would generate and package materials suitable to meet DOT transportation requirements. (Section 8.9).

Historic Resources

The environmental impact issue related to historical resources is the loss of Building 779 as an historic structure eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities. A related cumulative impact is discussed in a subsequent section.

Sixty-four buildings within the Site's Industrial Area, including Building 779, have been identified as important to the historic role of the Site in manufacturing nuclear weapons components during the Cold War (a list of these buildings is presented in Appendix 1 of the DPP). Building 779 was originally constructed in 1965, with additions in 1968 and 1973 (see Section 1.2.2 and Appendix 1). While this building, like the others, is less than 50 years old—one of the usual criteria for determining eligibility—it is considered historically significant as an essential component of the weapons production activities at Rocky Flats.

Negotiations are underway between DOE and the State Historic Preservation Officer (SHPO) concerning the appropriate mitigative measures applicable to these buildings; it is expected that Building 779 will be subject only to documentation requirements (collection or creation of construction drawings and photographs), rather than preservation. No modification of or damage to the building will occur prior to completion of such an agreement and completion of documentation according to standards accepted by the SHPO.

Noise

Decommissioning and demolition of the Building 779 Complex are not expected to significantly increase noise levels in the Rocky Flats area. Most activities will take place inside the associated building so that noise levels, if elevated over ambient levels, will be confined to the Building 779 Complex structure in which they are generated. Other, less common activities such as scabbling (use of a machine to remove layers of concrete), blasting (use of various materials such as sand, dry ices, or other abrasives to remove surficial contamination), and demolition by backhoe ram, hydraulic cutters, wrecking ball, or other devices are expected to generate noise levels higher than ambient noise levels. However, workers involved in those activities will use appropriate hearing protection devices during activities expected to generate high noise levels (Section 7.2). Outdoor activities will take place at a distance from unprotected workers and the public and thus are not expected to increase noise levels to these populations to an unsafe level.

Socioeconomic Effects

Potential impacts for the decommissioning of building 779 would attribute to a net overall loss of employment in the long run. The current on-site workforce in the building would either be drawn into the D&D activities for the building (and potentially for the entire site) or voluntarily lose employment. In the short run, the decommissioning activities could actually increase the employment level due to increased workforce levels associated with D&D activities. Additionally; a modest increase of purchases (raw materials, etc.) may result due to D&D activities in the short run.

Under the worse case scenario, if the entire workforce currently housed in building 779 all opted for voluntarily unemployment, the net overall impact would not have a great adverse effect on the Denver Metropolitan area nor would it adversely effect Boulder and Jefferson Counties, where the majority of the workforce reside. Taken as a single building, the net effects are expected to be minimal.

Cumulative Effects

Impacts associated with the decommissioning of the Building 779 Complex would contribute incrementally to potential site-wide cumulative impacts associated with the overall site closure program.

Some of these cumulative impacts may ultimately prove to be beneficial to the environment, assuming that the activities result, as expected, in the restoration of much of the Site's original, natural condition prior to construction. Removing human occupation, structures, and paved surfaces and reestablishing native grasses and other vegetation could restore native plant communities and increase wildlife habitat, including threatened and endangered species. Cleaning up contamination will reduce health risks to human and animal populations.

For other cumulative impacts, further study may be warranted. As with decommissioning of the Building 779 Complex, decontamination and decommissioning of structures site-wide will

generate transuranic, low-level, low-level mixed waste, and industrial (landfill) waste. Existing on-site interim storage for radioactive waste is limited (DOE/EA-1146), and eventually, as site-wide decommissioning progresses, additional storage capacity may be needed. The same is true for industrial waste; the existing landfill is nearing capacity and is scheduled for closure under the Site restoration program. In 1994, DOE prepared an EA and issued a Finding of No Significant Impact for a new sanitary landfill at the Site (DOE/EA-0914).

Also, demolition of the Building 779 Complex is part of a potential cumulative effect to historic resources. Demolition will result in the physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities. Other historic structures within this district are also proposed for decommissioning and presumed demolition. The cumulative effect of these removals may be significant (see mitigation measures below). Also, the collective effect of removing most or all of the structures would be visually dramatic. High profile structures that have dominated the Site and the local skyline for 45 years would be eliminated. The landscape would take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area before the plant was constructed.

Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity. For the decontamination and decommissioning of the Building 779 Complex, mitigation measures will be considered in the areas of human health, worker safety, release of emissions and mobilization of contaminants, and cultural resources.

Decommissioning will be conducted in accordance with applicable worker and public health and safety programs (Section 7.0); activities will be managed so that emissions and discharges are within applicable regulatory limits (Section 9.0). As required, decommissioning will take place within containment of existing buildings or temporarily constructed facilities (e.g., tents) with functioning drainage, air filtration, and other safety and environmental protection systems commensurate with risks inherent in the activities being conducted.

A runoff management plan will be developed and implemented to avoid contamination of groundwater or surface water.

If, during demolition activities, groundwater is encountered, the water will be characterized for contaminants and a determination of its acceptability for discharge obtained. If the water requires treatment, it will be sent to Building 374, 910, 995, 861, or another water treatment facility as appropriate. If the water does not need treatment, it will be discharged in accordance with the Site's National Pollution Discharge Elimination System permit and/or RFCA.

Precautions will be taken to ensure compliance with the Migratory Bird Act which prohibits destruction of birds or their nests, active or inactive, without a permit. Building surveys for such nests in the 779 Complex will be conducted prior to demolition.

No decommissioning activities will take place in or near habitat of known threatened or endangered species.

No modification of or damage to buildings determined to be eligible for the National Register of Historic Places will occur prior to completion of a Memorandum of Agreement with the SHPO and completion of documentation according to standards set forth in such agreement.

Unavoidable Adverse Effects

Building 779 Complex decommissioning activities, if conducted as proposed, will have the following unavoidable adverse effects:

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities;
- Short-term increases in air emissions and water discharges;
- Radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small but increased risk of adverse health effects;
- Possible industrial accidents, resulting in injury and illness; and
- Increased noise levels for the duration of decommissioning activities.

Short-Term Uses and Long-Term Productivity

Unlike most projects which commit a Site to a particular use for a period of time, the effect of decommissioning will be to undo past commitments concerning use of the Site and open up a new and broad range of potential future uses. Decommissioning does not commit the Site to a particular land use, rather, decommissioning of the 779 Complex will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses.

Irreversible and Irretrievable Commitments of Resources

Decommissioning is essentially a destruction project eliminating existing uses, not a construction project consuming land and building materials. Decommissioning of the 779 Complex will release land and perhaps some buildings for other uses. Funds, labor, equipment, fuel, tools, personal protective equipment, waste storage drums, and similar items are resources that will be irretrievably committed to the decommissioning project.